111. **Summary** of the **Analysis** of the Management Situation

CHAPTER III. SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION

This chapter begins with a general description of the LTBMU, followed by discussions of the interrelationships of national forest goods and services with the economic and social environments of the basin. This is followed by a discussion of each individual resource. Each section discusses the existing situation, focusing on supply and demand, and how the plan addresses production potentials and resource uses and opportunities.

More complete discussions can be found in the forest planning Environmental Impact Statement (EIS) and in the LTBMU planning records. Other documents which are frequently cited include: Lake Tahoe Environmental Assessment, Western Federal Regional Council, 1979; EIS for the Establishment of Environmental Threshold Carrying Capacities, TRPA, 1982; and EIS for the Adoption of a Regional Plan for the Lake Tahoe Basin, TRPA 1983.

A. General Description of the LTBMU

The following description of the Tahoe Basin is excerpted from the "Lake Tahoe Environmental Assessment", WFRC, 1979.

"The Lake Tahoe Basin encompasses about 500 square miles of which more than a third (122,600 acres) is the lake itself. The basin is located 150 miles east-northeast of San Francisco on the California-Nevada border. The lake, at 1,645 feet deep and maximum elevation of 6,229, is most famous for its crystal clear water. Aquatic ecologists classify it as 'oligotrophic', a term that indicates low biological productivity.

"The clear, blue waters of Lake Tahoe, in combination with its mountain setting and fresh alpine air, make the Lake Tahoe Basin unique in North America. The lake is one of the highest of its size in the U.S., second in depth only to Crater Lake. Protection of this scenic splendor provides the impetus for environmental thresholds developed for the Lake Tahoe Basin.

"The Lake Tahoe Basin has always provided a unique natural environment, but now it also provides a unique set of recreational opportunities. Its natural uniqueness is associated with the large, deep, clear lake, the rugged mountain setting, alpine air, and mountain vistas. Recreational opportunities are available in winter and summer. day and night. and indoors and outdoors. Recreation and nature are now intertwined at Tahoe, but the natural environment is fragile and easily damaged by human activity. Land development causes erosion, and the eroded material is carried to the lake, affecting its clarity. Land development and people-related activities also alter wildlife diversity and abundance and contribute to the degradation of Tahoe's alpine air and mountain vistas. There is now concern at every level of government over the extent of degradation and the fact that it is still accelerating. Moreover, there is a consensus that protection of the basin's environmental characteristics for future generations requires decisive action now."

B. The Economic Environment

The basin is the primary zone of influence considered in this discussion. Employment in the basin is tourist-oriented, and the casinos are the biggest employer. Activities on national forest land generate around 2,000 jobs or 5% of average annual employment. One hundred worker-years of that are by Forest Service employees, and most of the rest result from ski area operations. Timber production on national forest land in the basin currently only generates about four worker-years. Most new jobs would be ski-related, strengthening the winter economy when employment is at its lowest.

Recreation fees and special uses fees for resorts and ski areas generate the most revenues. Even so, it is estimated that collections in the basin amount to only $1,000,000 a year, with $250,000 divided among six counties for roads and schools in proportion to the area of national forest land.

In Fiscal Year '82. the LTBMU budget (not including land acquisition funds) was approximately $3.3 million. The recent trend in funding has been downward in some programs such as recreation and fire management, and upward for watershed and land acquisition programs.

C. The Social Environment

The most important social variables affected by the forest plan are related to population changes. The values and lifestyles of six social groups are influenced by these variables. Public services are also affected.

Concerns over population changes resulted in agreement between the TFPA and the Forest Service on the share of the basin carrying capacity that will be allocated to national forest visitors.

Six social groups have been identified by the interdisciplinary planning team. Two of the groups represent basin residents - those who favor more growth to support the local economy (Recreation Dependent Business Community) and those who want to maintain the social and environmental conditions that attracted them to the basin (Lifestyle-Oriented Residents.) The other groups are referred to as: Recreation Visitors, Owners of Undeveloped Lots, Old Tahoe Enclaves, and Environmental Groups. (See Table 111.1. Summary Comparison of Relationships of Social Groups to LTBMU Resources.)

The availability of utility capacity is reasonably certain. Sewage treatment capacity has been reserved and paid for in the South Tahoe plant, but would need to be purchased in other locations.

Water rights are limited and are being disputed in many places around the basin. The Forest Service should obtain the necessary water rights needed for future development, irrigation, and instream flows in order to carry out the plan.

Table III.1 Summary Comparison of Relationships of Social Groups to LTBMU Resources

Resources	Group 1 Recreation Dependent Business Community	Group 2 Lifestyle Oriented Residents	Group 3 Old Tahoe Enclaves	Group 4 Recreation Visitors	Group 5 Environmental Groups	Group 6 Owners of Undeveloped Lots
1. Developed Recreation	Profits from expansion to meet demand.	Expansion impacts lifestyles negatively.	Expansion impacts traditional lifestyle negatively; especially near enclaves.	Expansion to meet demand benefits this group as long as quality of experience is maintained.	Expansion increases risk of degrading environmental values.	Thwarted by land coverage being allocated to outdoor recreation instead of homes.
2. Wilderness Allocations	Little conflict between roadless areas in further planning catagory and suitable recreation sites except for ski potential in Granite Chief.	Benefits from wilderness designations to protect environmental values.	Benefits from wilderness designations, as long as management does not significantly increase use of areas - i.e., major trailheads in the enclaves.	Similar to Group 1.	Furthers aims of wilderness designations as means to protect environmental values.	Effects vary
3. Public Firewood	Benefits from current or increased supply if not adjacent to residential areas.	Impaired by cutting near residential areas.	Impaired by cutting in or near the enclaves.	Impaired by cutting near recreation sites that would degrade quality of experience.	Conflicts with values protecting sensitive land.	Effects vary
4. Timber Production	Detrimented by increased supply if threatens quality of recreation experience.	Increasing the supply may threaten environmental values.	Similar to Group 1.	Similar to Group 1.	Benefits from vegetative management with goal of maintaining environmental values.	Thwarted by use of land coverage for timber production instead of residential development.
5. Grazing	Benefits from allocation of pasture for saddle horses but not for red meat.	Similar to Group 1.	Similar to Group 1.	Effects vary	Aims thwarted by any grazing of stream environment zones.	Effects vary
6. Fish and Wildlife Habitat	Values conflict with habitat blocking recreation developement.	Benefits from more active habitat enhancement.	Similar to Group 2.	Values favor habitat enhancement as a benefit to recreation experiences.	Benefits from habitat protection and enhancement as an important environmental value.	Effects vary
7. Scenic Quality	Benefits from scenic quality enhancing recreation so long as it does not block recreation development.	Benefits from scenic quality protection and enhancement, even if it constrains other activities.	Similar to Group 2.	Similar to Group 1.	Similar to Group 2.	Effects vary
8. Water Quality	Impaired by water quality considerations blocking recreation development. Believes all impacts can be adequately mitigated.	Helped by protection and enhancement of water quality, even if it constrains other activities.	Similar to Group 2, except hurt by removal of summer homes and resorts from environmentally sensitive land	Similar to Group 1.	Similar to Group 2.	Hurt by water quality as a constraint preventing development of lots.
9. Off-Highway Vehicle	Effects vary	Hindered by use, especially near residential areas.	Aims furthered by decreasing existing use as it impacts traditional lifestyles.	Effects vary	Effects vary	Effects vary

D. The Resource Environment

1. Air Quality and Noise

Excellent visibility and clean, fresh mountain air to breathe are essential parts of the "Tahoe experience". Although air quality and visibility have declined at Lake Tahoe, they are still superior to most urban areas.

The four most significant air quality components are carbon monoxide, ozone, oxides of nitrogen, and particulates. Carbon monoxide (CO) is largely produced by automobile emissions. The Highway 50 corridor through South Lake Tahoe is currently the only area with a CO problem in the basin. CO concentrations have been as high as 16.3 parts per million (ppm) at the stateline monitoring station. This is well above the adopted standard of 6 ppm. In 1985 there were 188 violations of the standard.

Like CO, ozone is largely a result of auto emissions. Visibility is affected by particulates from wood smoke, dust, sulfate, and auto emissions. Particulate matter smaller than 10 microns in size (PM10) is considered a health hazard. Readings taken in the basin have been notably high on occasion. Oxides of nitrogen are also products of automobile emissions and other combustion. These oxides fall on the lake and support algal growth.

The Lake Tahoe air basin is a nonattainment area for air quality. The TRPA was assigned the task of preparing an attainment plan. A plan was approved in 1982 that contained six major actions to improve air quality. Standards were not achieved by the target date of December 31, 1987. The Environmental Protection Agency is expected to extend this date 4 or 5 years.

Since activities on the national forest contribute to the air quality problem, the forest is expected to aid in remedial action. Reducing vehicle travel, regulating slash burning, and dust control are some ways the Forest Service can help. Continued acquisition of land to prevent development is also one of the most direct methods.

Desolation Wilderness is a Class 1 air quality area. Preserving air quality is mostly dependent upon influencing sources outside the Lake Tahoe Basin.

Noise is becoming a major concern in administering the national forest. There are occasional complaints about chain saws, OHV, and low-flying aircraft over Desolation Wilderness. As noise measurements are taken in the future, actions may be necessary to meet single event and cumulative event noise standards that have been established for the area.

2. Adjacent Ownership

The Cold Creek area includes the only large private landholding left in the basin.

Several ski areas adjoining the basin have the potential to expand into the basin. (See the recreation section of this chapter.)

The needs and desires of many permanent and seasonal residents are discussed in the social environment section.

3. Diversity

It is an accepted ecological concept that diversity provides ecosystem stability. The basin's environmental thresholds also encourage diversity of forest communities.

There is little information available about the "natural" level of diversity in the Tahoe Basin. In the late 1800's, vast areas of the forest vegetation were clearcut to supply the Comstock mining towns of Nevada. Major fires were also widespread. This produced an increase of brushland and meadow communities. The dominant conifer forests have since been reestablished, reducing the area of open lands. Fire suppression also contributes to closing the forest canopy. Consequently, much of the basin has medium sized trees, with very few young stands and very little "old growth". However, plant succession is a dynamic process. Thus it will be necessary to counteract the trend toward climax conditions and loss of early successional stages.

Since 1900, 75% of the marshlands and 50% of the meadowlands in the basin have been lost to urban development. While this development was not the responsibility of the Forest Service, it does raise expectations that the marshes and meadows on national forest land will be protected. Since natural succession tends to convert meadows to forest, some management is required to maintain them in their current successional stage. More early succession stands of timber would be desirable to maintain viable populations of wildlife, especially deer.

4. Facilities

The Forest Service constructs, maintains, and manages a variety of structural facilities to support resource management programs. On the LTBMU, these include roads, trails, dams and diversions, and administrative sites such as offices, shops and fire stations. These facilities both entail costs and have environmental consequences.

a. Roads - A good Federal, State, and county road system accesses the *Lake* Tahoe Basin. No new routes are proposed, although other agencies may propose future improvements of the existing system.

A Tahoe Transportation District is authorized by the Bi-State Compact. Operation of public transportation systems is its mission. Since the defeat of the 1/2% sales tax to support the system, the district is disbanded at least temporarily.

Currently, a 240-mile road system is maintained by the Forest Service. This system will have to be enlarged somewhat to be adequate for the programs and uses planned, especially to serve recreation visitors. However, the primary emphasis will be on improving the quality of the existing system through reconstruction. Erosion from the road system has the most significant impact on water quality from national forest land. Proper drainage and stream crossings need to be installed, and cut and fill slopes stabilized.

b. Trails - The LTBMU has 127.6 miles of system trails. An estimated 70 miles of additional existing trails meet the criteria for inclusion in the system.

The trail types include: hiking, equestrian, and motorcycle. Bicycle and pedestrian ways linked to a total transportation system in the basin is also important to help with reducing the dependency upon automobile travel. Most trails are in need of repair. There are 30.7 miles of trail identified as nationally significant.

Public demand is increasing for all types of trail use. At least 154 miles of new trail are needed. A total of 278 miles of new trail have been reserved in the TRPA plan as the public "fair share".

c. Dams and diversions - There are 15 dams on the LTBMU. Fallen Leaf dam has been owned and operated by the Forest Service since 1951. Nine small dams were built by the California Department of Fish and Game in the 1940's to enlarge existing lakes in order to maintain streamflows and improve fish habitat. Management responsibility for these nine dams has recently been transferred to the Forest Service. Heavenly Valley Creek dam is under Forest Service jurisdiction although managed by the ski area for domestic, erosion control, irrigation, and snowmaking uses.

The Echo Lake Dam was built in the 1890's and is operated by the Pacific Gas and Electric Company. It diverts water into the American River system to generate electricity.

There are three other privately owned dams on national forest land but they do not affect management activities. Although physical conditions are suitable, new hydroelectric development is unlikely because of environmental protection requirements.

d. Administrative Facilities - There are 16 administrative sites containing 69 buildings or trailers. Additional employee housing, warehouse, and shop space are planned at existing sites. Many structures need replacement, and sites need treatment to comply with water quality standards.

5. Fire and Fuels

Wildfire has not been a serious problem in recent decades. This is due partly to aggressive suppression action, but also because of both natural and historically produced conditions. High elevation areas are not subject to intensive fires because of sparse vegetation and long winter snowpacks. Lower elevation areas have been heavily logged and burned within the past 100 years, providing a temporary form of fire hazard reduction. Urbanization has also broken the continuity of fuels with roads and other clearing of the forest.

Fuel loading is increasing in all areas as timber stands grow into an overstocked condition. Likewise, the risk of fire starts is high and increasing because of the large number of forest users and the presence of urbanization. Aggressive fire protection will continue to assure that the high values in the area are not lost. However, there is an opportunity to counteract the trend toward overstocked conditions by emphasizing timber management activities such as thinning and regeneration harvest. In addition. wildfire suppression strategies permit more use of containment and confinement strategies, thereby enhancing vegetative diversity in non-urbanized areas.

Forest planning analyzed fire programs with more suppression and more prevention than currently exists. Also analyzed were higher and lower budget levels. Little difference in area burned by wildfire was predicted between these strategies. Continuation of the 1982 organization and program emphasis was therefore selected for the future. An average annual wildfire burn of 44 acres is expected.

6. Fish

The management indicator species for fisheries are Lahontan cutthroat trout, rainbow trout, and brook trout. Table 111.2 identifies the reasons for their selection and the habitats they represent.

Table 111.2. Fish Management Indicator Species for the LTBMU

Species Indicated	Reason for Selection	Habitat Components and Ecosystems
1. Lahontan cutthroat	Recovery Species (threatened)	Small to large streams and alpine lakes. Spring spawner, stream spawner.
2. Rainbow trout	RPA Emphasis group (cold water resident and migratory fish harvest)	Medium to large streams and some large lakes with tributary streams, including Lake Tahoe. Spring spawner, stream spawner.
3. Brook trout	RPA Emphasis group (cold water resident fish harvest)	Small to large streams and alpine lakes. Fall spawner, stream and lake spawner.

Fishing is a major summer recreational activity on the LTBMU with over 45,000 wildlife and fish user days (WFUD) reported each year. Approximately 80% of that use is associated with lakes and California Department of Fish and Game (CDFG) stocking programs. The remaining 20% is associated with stream habitat and self-sustaining populations. Demand appears to exceed supply in easily accessed areas, while supplies meet or exceed demand in more remote areas. There are more than 98 lakes covering over 1,600 surface acres in the LTBMU; all but one are in California. Most are in Desolation Wilderness. Generally, lake habitat is of good quality.

There are also 41 perennial streams, totaling approximately 164 miles. Current estimates of habitat quality of resident trout streams indicate over 60% of these are good to excellent quality habitat (Table 111.3). Over 80% of these stream miles are rated as poor for migratory trout because of barriers and poor habitat quality. However, migratory habitat is very important for Lake Tahoe fisheries.

Table III.3. Current and Potential Stream Quality
(Streams on National Forest within the LTBMU)

	Miles of Streams			
	Resident		Migratory	
Quality Rating 1/	Existing	Potential	Existing	Potential
Excellent	24.1	42.8	4.8	5.8
Good	37.9	37.5	6.7	52.2
Marginal	38.0	19.7	52.5	6.0
Total	100.0	100.0	64.0	64.0

1/ Quality ratings based upon TFPA stream survey methodology" which evaluated each stream by streamflow, pool abundance, aquatic cover, substrata, slope canopy, aquatic vegetation, benthic fauna, fish abundance, reproduction, bank/channel stability, stream gradient, barrier/obstructions and diversions (IRPA 1982).

Fourteen species of fish are known to occur in streams and lakes on the LTBMU as shown in Table III.4. Rainbow, brook, and brown trout are most common in resident streams: brook trout is the most abundant and widespread.

Presently, only historical habitat exists for the Lahontan cutthroat trout, a threatened species. A hybrid strain of the species exists in 40 acres of *lake* and 20 miles of stream. Planting is necessary to sustain the population. Several lakes and four miles of stream in the upper reaches of the Truckee River are being studied for reintroduction of pure Lahontan cutthroat.

Based upon habitat capability ratings for streams and an estimate of habitat capability of *lakes,* 88,900 pounds of fish are produced with approximately 7,000 pounds in streams and 81,900 pounds in *lakes.*

An active and highly developed watershed program in the basin has restored or improved habitat. The RPA goal is to improve the capability of inland trout habitat by 20% by 1990. The environmental thresholds also call for enhancing stream habitat. About 75 acres of stream habitat on the unit are available for improvement. Few if any lakes are physically available for improvement. Habitat improvements are needed in Lake Tahoe which could influence shorezone activities on national forest land.

Fish habitat improvement opportunities include removal and/or modification of barriers and diversions in spawning streams, improvement of instream and bank

cover, improvement of stream bank stability, and the nearshore fish habitat improvement of Lake Tahoe.

Another critical factor in maintaining and enhancing fish habitat is the maintenance of instream flows for all resident and migratory trout streams. Instream flows were measured in many streams in 1985-86.

"Rise to the Future", a program designed to produce more fish through habitat improvement, will be implemented in this planning period. It is a cooperative program between the Forest Service, other Federal agencies, State departments, Tribal governments, user groups, and the public.

Table 111.4. Fish Species Occurrences 1/

Fish Species	Surface acres of natural and artificial *lakes* 2/	Miles of stream
Brown trout	247	87.9
Rainbow trout	997	102.6
Cutthroat trout	40	22.6
Eastern brook trout	580	158.0
Golden trout	12	0.0
Lake trout	638	0.0
Mountain whitefish	0	13.3
Kokanee salmon	690	13.9
Lahontan redside	unknown	11.6
Tahoe sucker	unknown	21.0
Speckled dace	unknown	18.0
Tui chub	unknown	9.6
Piute sculpin	*0*	2.0

1/ TRPA and USDA, 1971, Fisheries of Lake Tahoe and its Tributary Waters, A Planning Guide.

2/ Some overlap where more than one species exists in the same lake or stream.

7. Forest Pests/Integrated Pest Management

Three tree diseases (dwarf mistletoe, limb rust, and root rot) and three insects (Jeffrey Pine beetle, mountain pine beetle, and fir engraver beetle) currently affect the attainment of resource objectives in the Lake Tahoe Basin. Much of the bark beetle damage has occurred to trees in stands which were also affected by various combinations of overstocking, dwarf mistletoe, and limb rust disease. Tree mortality caused by these pests detract from the visual quality of the basin. increase the risk associated with wildfire, and create a public hazard. Rodents also cause problems, especially since they can be plague carriers. The Forest Service provides monitoring and reporting support in cooperation with State and county agencies.

The LTBMU will continue to utilize an integrated pest management (IPM) approach to reduce and/or maintain pest caused losses at acceptable levels.

Pest management strategies are incorporated into resource management plans and practices in contrast to viewing insect and disease problems as independent of land and resource management goals and objectives. Vegetation management will significantly reduce the risk of insect and disease related losses.

a. Geology and Groundwater

Geologic Hazards

Landslide hazards pose a threat to human safety, water quality, soil productivity, aesthetic qualities, man-made developments and fish and wildlife habitat within the basin. Natural and man-caused mass movements occur more frequently in steep terrain and are also affected by physical characteristics of the rock and soil, amount, timing and duration of precipitation. fluctuations of groundwater, and freeze-thaw action. Road building or reconstruction, timber harvesting, intense burning, mining, recreational facilities and even construction of private residences or other facilities can alter the equilibrium of slopes thereby causing landslides. Except for ski area development, future forest management will avoid disturbance of steep terrain; however, past activities may precipitate landslides. A map of the basin's natural hazards was produced for the TRPA in 1974. That information will be considered in site-specific planning and will be supplemented as information becomes available.

Earthquake hazards exist within the basin, but may be more strongly influenced by active fault zones to the east and north of the basin. Large destructive earthquakes will occur at some unpredicted time in the future. The primary effects will be from groundshaking and its potential damage to buildings, dams or other structures, and from earthquake induced landslides. Risk to human safety could be a factor.

Volcanic hazards are not expected to be significant except for possible deposits of volcanic ash in the event of volcanic eruptions in the Mono Basin-Long Valley region or at Mt. Lassen. Snow avalanche potential is high. due primarily to the steep topography. Winter travel requirements and winter sports activities increase the risk to human safety and recreational developments. New structures and facility sites are located with the guidance of the Bailey system. A geologic resource inventory will add to the current base of information and provide further assistance in avoiding geologic hazards.

Geologic Resources

Current overall groundwater use for national forest purposes is relatively small, but is expected to increase in the future. Adequate supplies are believed to be available, but in some areas groundwater quality has declined. Further study is needed to determine location and size of aquifers and groundwater quality. A groundwater management plan with mitigation measures to restore degraded groundwater quality is also needed.

Rock and soil materials are potentially abundant within the basin, however most material is imported from outside sources. When landslides or construction projects produce excess material it is utilized on other projects where needed,

stockpiled, or hauled outside the basin. All materials sources will include mitigation and restoration plans.

There are many areas of geological interest within the basin, however none on National Forest land are currently recommended for formal Special Interest Area designation. The land owned by the State of California around Emerald Bay has been designated a National Natural Landmark for being an outstanding illustration of glacial geology. The LTBMU lands around Emerald Bay will be studied to determine if they warrant designation as a special interest area for their geologic interest and scenic beauty.

9. Historical and Cultural Resources

Cultural resources on the LTBMU are managed as a nonrenewable resource. Various laws, orders, and regulations dealing with cultural resources provide direction and delineate responsibilities within the program. Briefly, the LTBMU is charged with the inventory, evaluation, enhancement, and protection of those cultural resources located on national forest lands or affected by federally approved or funded undertakings. This management is carried out in a framework of working relationships with the respective State Offices of Historic Preservation and various other agencies, institutions, and individuals including the local Native Americans and the Washoe Tribe of Nevada and California.

The inventory and evaluation of cultural resources on national forest lands has helped to better the understanding of local history and prehistory. Currently, archaeological evidence suggests that seasonal or periodic occupation of the basin extends back at least 9,000 years.

Historic resources are many and varied, resulting from the differing trends in the economic utilization of the Tahoe Basin's resources. They include sites and remnants from early logging and lumbering, toll roads and waystations, early resorts and hotels, and luxurious private estates, as well as from early Forest Service activities in the basin. Three of the Estates have been accepted on the National Register of Historic Places, and other sites appear to be eligible.

Approximately seven percent, or 10,000 acres, of national forest lands in the basin have been inventoried, with few cultural sites having been either well documented or evaluated. This continues to be the greatest need within the cultural resource management program on the LTBMU. Lack of a comprehensive cultural overview and a sufficient data base hinders the management of known resources.

Current and future management goals include the need to improve the public's awareness of and appreciation for Tahoe's cultural heritage, through such means as interpretation of the Tallac Historic Site and assistance to the Washoe Tribal Council with their effort to reestablish their traditional cultural ties within the Lake Tahoe Basin.

10. Lands

a. **Landownership Adjustment** - Land acquisition has been a significant factor in the management of the Lake Tahoe Basin with over 46,000 acres acquired since

1965 at a cost of over $76.8 million. Prior to 1965, the principle means of adjustment was by land exchange. The emphasis then shifted to purchase through the Land and Water Conservation Fund. PL 96-586 (Santini/Burton Act) was enacted in 1980 to acquire up to 7,980 unimproved building lots and other parcels of land totalling up to 21,220 acres of environmentally sensitive land. Direction developed for implementation of PL 96-586 is incorporated into this forest plan. Under PL 96-586, land not typically managed by the Forest Service is being acquired. This land can be transferred to appropriate State or local government for administration.

Both the States of Nevada and California have enacted legislation for land acquisition similar to that of the Federal Santini/Burton program. Cooperative planning has assured the greatest efficiency in these public programs.

Transfer of private land, especially that zoned for development, to public ownership directly assists in achieving many environmental thresholds as well as meeting recreation and other goals of the Forest Service.

b. Landline Surveys - The lands of the basin were originally surveyed in the 1860's and 1870's. Some of these original surveys were proven to be fraudulent or of poor quality. During the rapid urbanization of the 1960's and 1970's, many private surveyors were active in the area. Numerous conflicts between surveys have occurred, leading to an unknown number of unauthorized occupancies and use violations on national forest lands. Land acquisition is increasing survey needs. In the basin, 230 miles of surveys are needed at a cost of $1,219,000 to eliminate the backlog.

c. Nonrecreational Special Uses and Utility Corridors - The LTBMU administers 113 nonrecreational special use permits. In addition to these permits, there are many miles and acres of public service facilities on acquired lands which are usually guaranteed under deeded easements from the original landowner and are not under permit. These often contribute to the environmental impacts from lands in public ownership. However, the Forest Service has very limited authority to require correction of these impacts.

Increasing urban development generates the greatest demand for special uses of national forest land. Future demand will probably be for utility lines, communications facilities, and access to private land.

No corridors or windows are designated for major utilities because of the significance of the basin's recreational and scenic resources and the difficulty of maintaining water quality.

d. Withdrawals - A withdrawal is the withholding of an area from application of the general land laws (including the mining laws) for the purpose of limiting activities in order to maintain other public values in the area or reserve the area for a particular public purpose or program. On the LTBMU, there are 31,816 acres withdrawn from mineral entry.

e. Rights-of-way Acquisition - Frequently the use of national forest lands, resources, or services are precluded because there is no public right-of-way to allow access. Rights-of-way are needed for 13.5 miles of road and 17.4 miles of trail as of 1984. Some of this need will be met by land purchases.

11. Minerals

The LTBMU is not well endowed with mineral resources. Although there were a few mines actively worked in the past, at present there are none in the basin. There have been no operating plans submitted recently. Increased exploration can be expected if the area becomes cost effective relative to other sources.

Outstanding rights to the mineral estate have been reserved on about 5,500 acres of acquired land. Additional acres are being added through the ongoing acquisition program.

About 2,500 acres have a high probability for the occurrence of metallic mineral resources. Over 30,000 acres have a low to moderate probability for metallic minerals. The BLM has classified much of the north shore as being "prospectively valuable" for low-temperature geothermal energy, suitable for direct heating. Because of the basin geology, the east side of the lake has a moderate probability for similar opportunities.

The Forest Service utilizes about 830 tons of mineral material annually. This level is expected to remain the same. Although sources for these materials exist on national forest land, water quality concerns have and will continue to limit use of any significant amount of mineral material from sources within the basin. Future availability is expected to be good from sources outside of the basin.

The TRPA has taken a prohibitive stance on mineral development in the basin because of concerns for water, scenic, air quality, and for the protection of other values. Although the Forest Service may approve operating plans for mineral development, obtaining permits from the TRPA and local agencies could be difficult for an operator. There have been no recent applications for new permits.

12. Prime Agricultural Lands, Wetlands and Floodplains

Because of the short growing season and poor soils, no areas in the basin are considered prime agricultural lands. Wetlands and floodplains, which require special management under Executive Orders, are discussed under the Riparian Areas and Stream Environment Zones section and the Water section of this chapter.

13. Range

For nearly 130 years the Lake Tahoe Basin has been an easily accessible late summer grazing area. Over the last 30 years, rapid urban and recreational development have reduced the area available for livestock grazing. There are three cattle allotments, two horse pastures, two pastures for Forest Service horses, and part of two sheep allotments. The sheep allotments are administered by the Tahoe National Forest.

All allotments have operated on and will continue to operate on the extensive management strategy. Overall the condition of the rangeland is considered good, but there is concern that grazing is adversely impacting water quality, wildlife, and fisheries. Further study of the situation is needed.

Local demand is expressed for increased commercial livestock operations. There is also considerable demand by individuals for backyard or neighborhood horse pasture and corrals on national forest land.

14. Recreation

Recreation is probably the most significant land use on the LTBMU except for the production of water at the high standard required for maintaining the exceptional clarity of Lake Tahoe.

a. Developed Recreation - Developed Recreation sites on the LTBMU include six campgrounds, five beaches, four picnic areas, and four interpretive sites with a total capacity of 7,650 Persons At One Time (PAOT). Some future demand could be accommodated at existing sites before any new construction is required. Currently these facilities are being operated at a "low standard" service level. The quality of the recreation experience is declining and sites are not being maintained.

There is ample national forest land suitable for development to provide for the remainder of the expected demand which is about a 1% increase per year. The Forest Service has pursued the establishment of a "fair share" of remaining capacity in the basin for public outdoor recreation. TRPA acknowledges this need and has set capacity aside for it. Recognition of the "fair share" may be the only assurance that opportunities for meeting outdoor recreation demands will be available in the future and will not be lost to the more rapidly occurring private land development.

The LTBMU administers nearly 600 special use permits for recreation residences on 23 tracts. Future use determinations have shown no conflicts severe enough to warrant termination of permits. Current direction does not allow increase in land coverage for existing recreation residences nor construction of new recreation residences. Also administered are permits for six resorts, three organization camps, two stables. and one campground operated by the California State Parks. All are important assets for providing public outdoor recreation.

With increased recreation use comes increased vehicle travel. The Forest Service has a share of the capital improvements necessary to reduce vehicle miles traveled by 10%. This is in addition to the mitigation that would occur on many new projects.

b. Dispersed Recreation - Total dispersed recreation has generated just over one million RVD per year over the past six years. There is strong demand for dispersed recreation both from visitors to the basin and from the increasing resident population. Much of the means for accommodating more dispersed recreation involves improving public access. Both winter and summer parking are needed for a variety of dispersed recreation activities.

Outfitter guide permits to lead tours on national forest lands are often granted, but must be compatible with other uses. Permits for recreation events, such as races, are considered on a case-by-case basis.

Desolation Wilderness, a unit of the National Wilderness System, is managed by the LTBMU and the Eldorado National Forest. In 1976 a quota on overnight

visitors was initiated to prevent overuse. Day use continues to increase, which may be affecting the quality of the wilderness. Demand for entry into Desolation Wilderness will continue to increase and probably would not be reduced by offering other destinations.

c. Winter Sports - Heavenly Valley is the largest alpine ski resort in the basin with a current capacity for about 10,000 skiers at one time. It is principally on national forest land and is administered by the LTBMU. Small portions of Alpine Meadows (administered by the Tahoe National Forest) and Ski Incline are also located on the LTBMU.

Demand for skiing is expected to increase at about 2% each year. Both the Forest Service and the TRPA have provided opportunity to expand skiing, as long as the adverse impacts are offset.

Five sites are available for expansion or development. They are Northstar, Alpine Meadows/Deer Park, Heavenly Valley, Ski Incline and the Homewood/Tahoe Ski Bowl complex. Development is dependent upon demonstration that there would not be adverse impacts upon the environmental thresholds.

The decision remains in effect not to consider Freel Peak, Stevens Peak, Waterhouse, and Blackwood areas for ski development.

A large, but not yet developed, skiing complex, Galena Resort at Mt. Rose, may meet much of the demand at the north shore of the lake. Similar proposals elsewhere outside the basin could also affect conditions at the lake.

d. **Off-Highway** Vehicle Use - The LTBMU first developed an OHV plan in 1976. The OHV direction in the forest plan supersedes the original OHV Plan; however, management philosophy remains unchanged. Except for over-the-snow vehicle travel, there is no off road or off trail vehicle travel allowed in the basin. Motor vehicles, including OHV, are allowed only on roads and trails designated for such use. Many existing roads and trails will be closed to all use and rehabilitated to a natural condition. Others that have been used by OHVs in the past will be closed to all or some types of motorized use or have seasonal restrictions. Some new summer and winter OHV routes will be designated or constructed to enhance recreation opportunities.

e. Recreation Opportunity Spectrum Classes - The ROS system is a means of classifying recreation experiences by the kind of facilities and degree of contact with visitors. The system is used to assign a variety of existing and potential recreation activities and opportunities to national forest system lands. Most people enjoy experiencing a variety of opportunities offered by the variations between ROS classes. This is especially true in the Lake Tahoe Basin. Table III.5 displays the current mix of ROS classes, their capacity, actual use, potential use. and projected demand. Semi-primitive Non-Motorized is the only ROS class where projected demand exceeds capacity. It should be noted that there is currently no portion of Desolation Wilderness (within the Lake Tahoe Basin) that meets the criteria for Primitive ROS class because of the intensity of use.

Table III.5. Recreation Opportunity Spectrum
(Capacity, Dispersed Use, and Demand)
(Based Upon 1982 Land Status)

ROS Class	Acres	PAOT Capacity	Potential RVD Capacity	Actual Use RVD	Demand in 2030 Projected RVD
Semi-primitive Non-Motorized	53,500	1.766	218,984	162,373	254,926
Semi-Primitive Motorized	17,600	443	70,880	9,512	14,934
Roaded Natural Area	55,700	2,865	670,410	409,228	642,488
Rural	11,900	3,286	834,360	500,169	785,265
Total	138,700	8,360	1,794,634	1,081,282	1,697,613

15. Research Natural Areas

The Research Natural Area (RNA) system protects ecosystems for scientific study. There are no existing RNA in the basin. This plan directs that Grass Lake Moss Bog (peatlands) be recommended to the Chief of the Forest Service for establishment of an RNA.

16. Riparian Areas and Stream Environment Zones

There are 17,718 acres of stream environment zone basinwide. There are approximately 7,500 acres of national forest lands classed as stream environment zone (SEZ). Of these, approximately 50% (3,700 acres) are considered riparian areas. Riparian areas are extremely important to wildlife, recreation, and scenery. But at Lake Tahoe the stream environment zones have the greatest significance in relationship to water quality management. These zones are valued for the natural sediment filtering and nutrient recycling capability they perform on surface runoff before it reaches Lake Tahoe.

Forest Service direction has restricted disturbance in SEZs. This is re-emphasized for the future, not only in this plan, but also in the TRPA and State water quality plans. The Watershed Improvement Needs (WIN) inventory identifies acres of SEZ requiring restoration **work.** Land acquisition under PL 96-586 emphasizes purchase of privately owned SEZ.

17. Sensitive Plants

The LTBMU has listed seven sensitive plant species. (See Table 111.6. Sensitive Plants of the Tahoe Basin.) Regional policy states that sensitive plant species will be managed to ensure that species do not become threatened **or** endangered because of Forest Service actions. Environmental thresholds require preserving a minimum number of sites **for** each. Management plans have been prepared for most of these species. Rorippa subumbellata, a plant

which grows on Lake Tahoe's beaches, is the only species subject to human disturbance.

Table III.6. Sensitive Plants of the Lake Tahoe Basin

Species	Management Sensitivity 1/	# of Population Sites NF Land	Other Owner
Carex paucifructus	3	1	Unknown
Draba asterophora var. asterophora	3	5	0
Draba asterophora var. macrocarpa	2	2	0
Eriogonum umbellatum var. torreyanum	3	Unknown	Unknown
Lewisia pygmaea ssp. longipetala	1	2	0
Rorippa suhumhellata	1	2	24
Silene invisa	3	Unknown	Unknown

1/ 1 = Current or potential threats or jeopardy from forest management.
2 = No or minimal threats or jeopardy from forest management activities.
3 = Insufficient data at this time to evaluate threats or Jeopardy from forest management activities.

18. Soils

Soils are a major consideration in managing the forest since their characteristics largely affect timber and forage growth, and the ease of road and other facility construction. Conserving the soil resource is also the underlying strategy for maintaining vegetation and preventing erosion that is essential to preventing further degradation on water quality.

A 1974 soil survey by the Soil Conservation Service describes the 30 specific soil types in the Lake Tahoe basin. Most of these soils are geologically young and poorly developed. They have a low level of cohesion, and thus carry a high erosion potential. The soils range from low to high in productivity.

Maintaining soil productivity should present few difficulties to the manager provided accepted protection practices are applied. Of greatest concern is where ski runs are to be cleared of native vegetation and the soil groomed. This is done to obtain the maximum skiing opportunity when there is meager natural snowfall, or where snowmaking is employed. These ski runs are usually on steep slopes having highly erosive and infertile soils where restoration and revegetation work is very difficult.

19. Special Interest Areas (SIA)

As a result of this planning process one special interest area will be established on the LTBMU: the Tallac Historic Site. Its 225 acres will be managed with an emphasis on its unique historic resources. Several other areas were identified for further study in this planning period to determine if they should he designated SIAs and to determine their boundaries. These are:

Emerald Bay (geologic and scenic resources);
Osgood Bog (paleobotanical resources);
Freel Peak Cushion Plant Community (botanical resources); and
Taylor Creek Wetlands (botanical and zoological resources).

20. Timber and Vegetation

During the Comstock mining period large areas of the basin were stripped of trees to provide lumber for the mines. Once the mines ran out and recreation became prominent, timber production declined. The forests regenerated, producing an 80 to 100 year old forest that lacks diversity and is susceptible to insect and disease attacks. Some timber stands are understocked, others are overstocked. The cost of logging, in a manner that maintains water, scenic, and air quality, often makes commercial timber sales financially marginal. This is especially true on moderate or high hazard land. The LTBMU has not had a regulated timber harvest program but has cut about four million board feet annually in recent years, over half of which has been for firewood.

Several thresholds for vegetation have been established for the basin which are important for protecting the environment. Not all have been well tested to determine effects upon other thresholds and programs.

The LTBMU has a total timber volume of over two billion board feet growing at a rate of about 32 million board feet per year. Based on a 1980 timber inventory 78,550 acres were classified as tentatively suitable for timber production, but as a result of economic analysis all lands were determined to be unsuitable. (See Tables III.7 and 111.8.) Much of the volume is on land that is not currently accessible by road or would require the use of aerial logging techniques to avoid damaging the soil.

Total demand and consumption of wood products in California is projected to double by the year 2030. Though only a small volume of unregulated products will be harvested from the basin during this planning period, the yield will contribute to this need for wood products. The timber inventory and growth potential of the basin are being carefully protected and could be called upon should the need arise. For the present, no industry or community relies upon timber harvest from the basin (Dornbush, David M. and Co. Inc. Socio-Economic Interrelationship Study, Central Sierra Forest and the LTBMU, 1981).

The Regional Guide RPA target for programmed sales offered from the LTBMU calls for an increase to 10.7 million board feet by the year 2000. This is more than double the current output and cannot be reached without potential harm to water quality. Economic considerations would also influence achieving the RPA target. An estimated 66,000 cords of firewood is utilized each year by people in the basin. Twenty percent of this is harvested in the basin.

Table III.7. Timber Productivity Classification

Potential Growth (cubic feet/acre/year)	Suitable Lands (acres)	Unsuitable Lands 1/ (acres)
Less than 20	0	56,630
20-49	0	10,062
50-84	0	32,894
85-119	0	35,455
120-164	0	3,443
165+	0	216
	Total	138,700

1/ see next page for footnote.

Table 111.8. Timber Land Classification

	Classification	Acres
1.	Non-Forest land (includes water)	21,076
2.	Forest land	126,657
3.	Forest land withdrawn from timber production (Desolation and Granite Chief Wilderness)	21,330
4.	Forest land not capable of producing crops of industrial wood.	29,787
5.	Forest land physically unsuitable:	0
	irreversible damage likely to occur:	0
	not restockable within 5 years.	0
6.	Forest land - inadequate information 2/	9,033
7.	Tentatively suitable forest land (item 2 minus items 3, 4, 5, and 6)	66,507
8.	Forest land not appropriate for timber production (not cost efficient in meeting plan objectives). 3/	66.507
9.	Unsuitable forest land (Item 3, 4. 5, 6. and 8)	126,657
10.	Total suitable forest land (Item 2 minus item 9)	0
11.	Total national forest land	147.733

1/ Productivity for lands, such as wilderness, where data are not available was estimated. Table 111.7 does not include 6,534 acres of newly acquired land which have not yet been inventoried.

2/ Lands for which current information is inadequate to project responses to timber management. Usually applies to low site and newly acquired lands.

3/ Lands identified as not appropriate for timber production due to:
(a) assignment to other resource uses to meet forest plan objectives;
(b) management requirements: and (c) not being cost efficient in meeting forest plan objectives over the planning horizon.

21. Visual Resources

About 45% of the LTBMU is classified as distinctive (Class A). The remaining 55% is classified as common (Class B). Most people come to view the lake as well as the scenic background. Unfortunately, there are few easily accessed points from which visitors can view the lake. A cooperative effort is needed from many agencies to improve this situation. At selected vistas, vegetation must be managed so that views are not obstructed.

The forested lands of the basin are generally as attractive now as they ever were. The most visible impacts on the national forest are recreation developments, roads, and utilities. At least 94% of the LTBMU shows no visual evidence of human disturbance from middleground views, and on another 3%, disturbances do not dominate the natural landscape. The most common type of

disturbance affecting visual quality is vegetation removal, such as for road building or ski run clearing. Most visual restoration has and will continue to occur as a part of the watershed restoration program or through facility maintenance and reconstruction. Protection of scenic quality is a high priority in this plan.

Tahoe Regional Planning Agency has designated all State and Federal highways as scenic viewshed corridors. The LTBMU will cooperate in developing scenic viewshed corridor plans on all highways with mixed public and private ownership.

22. Water

Lake Tahoe has long been famous for its clarity, size, and depth. Today, the declining quality of water in the basin is of great concern. After the basin was sewered in the late 1960's and early 1970's (all effluent is exported), the primary threat to water quality became erosion resulting from land disturbing activities and nutrient contamination of both surface and groundwater. (See also the section on geology and groundwater.)

The Forest Service protects water quality at Lake Tahoe by requiring Best Management Practices (BMP) on new projects, by using the land capability system, and by acquiring undeveloped environmentally sensitive land. The land capablity system, which is summarized in Appendix F of this plan, guides the location and amount of activity and development in any one place. Impervious surface coverage and permanent soil disturbance is variably restricted through a range of land capability classes (or tolerance for disturbance areas). The primary Forest Service facilities that produce impervious coverage are permanent roads, parking areas, buildings, and developed recreation sites. Permanent disturbance consists of heavily groomed ski runs and road cuts and fills that would not recover fully over time. Other activities, such as timber management and cleared ski trails, produce disturbance that recovers over time.

The State of California and TRPA water quality plans for the basin require the use of BMP to minimize the effects of new projects on water quality and to remedy problems on existing developed sites or where there is past disturbance. (See Appendix H of the plan for details on water quality plans for the Lake Tahoe area.)

A Watershed Improvement Needs (WIN) inventory identifies erosion and water quality problems on national forest lands which must be corrected over the next 20 years. Cost of the program is estimated at $1,050,000 per year. The amount of disturbed area needing restoration continues to grow with land acquisition.

Watershed management plans for the Lake Tahoe Basin identified over $160 million in remedial work required by State and local governments to comply with established standards for erosion control, surface runoff control and other water quality protection measures. Programs to perform this remedial work (including federal grant funds provided through the Santini/Burton Act administered by the Forest Service) have reduced the inventory to about $128 million. This work is to be completed by 2005 which requires an expenditure of $7.1 million/year. This does not include the work on national forest (estimated as about $22 million) and State park lands. Neither does it include

remedial work required of individual private landowners for which there is a ball park estimate of $30-50 million.

A more recent concern for water quality is the deposition of nutrients into the lake from the air. The extent of this problem is under study and may, or may not prove to be of greater significance than soil disturbing activities. In the meantime effort is directed at reducing or controlling sources of airborne nutrients (see Air Quality).

The top six feet of the lake is regulated as a reservoir. About 720,000 acre feet are available for local and downstream use. Over 400.000 acre feet evaporate from the lake's surface each year. The average runoff from national forest lands in the basin is 26 inches for a total of 317,600 afa. This represents approximately 50% of water entering Lake Tahoe. About 0.5 inches of the runoff is diverted for domestic and municipal use and another 6.5 inches flows out of the basin into the Truckee River. About 881 afa, or 0.3% of the total water yield in the basin, is currently used by the Forest Service. A portion is as appropriated water rights, but there are also 61 wells in California. Many springs have been developed to serve recreation residences and administrative sites.

The California-Nevada Interstate Compact sets the amount of water that can be diverted from the lake at 34,000 afa to ensure adequate flows for downstream Truckee River and Pyramid Lake water uses. There are extensive demands on this relatively small supply. In many places, both in the basin and downstream, extensive water rights disputes have occurred and continue to do so. It is imperative that the Forest Service identifies water needs for future instream flows, development, and irrigation and obtains the necessary water rights.

The State of California is currently attempting to allocate water as directed by the Interstate Water Compact. Nevada is planning to do so within a few years. The Forest Service has requested that adequate water be made available to implement this plan.

Vegetation management activities can increase water yield. However, increases beyond 5% would probably lead to increasing erosion rates and nutrient loading in the lake.

23. Wilderness

Desolation Wilderness is one of the most heavily visited areas in the wilderness system. In 1979 the Forest Service imposed restrictions on the number of overnight visitors in order to protect the area from the impacts of high use and to maintain greater opportunities for solitude.

Five roadless areas were inventoried in RARE 11. The 1984 California Wilderness Act designated the Granite Chief Wilderness, which includes 30 acres on the LTBMU, and released Dardanelles, Pyramid and the rest of Granite Chief in the basin for nonwilderness purposes. Freel was designated for further planning in the Act.

Freel and Lincoln Creek, in Nevada, are prescribed for esentially undeveloped, but nonwilderness management in this plan. Mt. Rose, because of acquisition of

large tracts of private land, was identified and subsequently recommended in 1985 by the Toiyabe National Forest for wilderness designation. This plan recommends a contiguous portion of the basin as part of the recommendation.

24. Wildlife

Over 250 wildlife species inhabit the basin during all or part of the year (Osaki 1980). Each of these species of mammals (64), birds (168), reptiles and amphibians (23) occur here because certain habitats are available that meet their needs. The quality and size of these habitats generally determine the abundance of any one species or animal population.

Game species include mule deer, black bear, waterfowl (ducks, geese and coots), and blue grouse. The numerous firearm closures imposed by the different municipalities in the basin limit hunting.

Two Federally endangered species, the bald eagle and Peregrine falcon, are found on the unit. In addition, the Sierra Nevada red fox and the wolverine are found in the basin and listed as threatened by the State of California. Species classified as "sensitive" by the Forest Service which occur or are believed to occur on the unit are the spotted owl, goshawk, Sierra Nevada red fox, pine marten, fisher, and willow flycatcher. The golden eagle, osprey, pileated woodpecker, wolverine, and mountain lion are species of special interest to the public.

The Forest Service has the responsibility to manage wildlife habitat on national forest lands. Responsibilities for managing wildlife populations, such as setting hunting regulations, fall to the respective States. Therefore, the issues in this plan are addressed in terms of wildlife habitat management. Habitat is managed primarily through vegetation manipulation. Practices that may benefit some species may negatively affect others. Careful coordination is essential to provide habitat for a diversity of wildlife. (Also see Diversity, section D.3, of this chapter.)

Urban and recreational development, extensive clearcutting, subsequent fires and natural regeneration of the forests in the basin have had significant effects on wildlife habitat. A large influx of people, intensive recreational use, water diversions for domestic and agricultural use, changes in wildfire patterns and the introduction of nonnative species have also had substantial impacts on native wildlife and its habitat.

Management Indicator Species

The Forest Service must manage habitat to, at the least, maintain viable populations of existing native and desired nonnative species. Management indicator species (MIS) have been selected to monitor the effects of management practices on native and desired nonnative vertebrate species within the planning area (see Table III.9). These indicator species represent groups of species with similar habitat requirements; thus, management of these species to maintain viable population levels should also provide for viable populations of the remaining species in the group they represent (see Table 111.10). MIS can also be used to identify needed habitat management in a given area and to predict the effect of a given management practice on habitat for a species.

Table III.9. Wildlife Management Indicator Species for the LTBMU

Species	Reason for Selection	Habitat Components and Ecosystems Indicated
1. Bald eagle	Recovery species (endangered)	Large bodies of water, some isolation from human disturbance, mature conifers with canopy closure less than 40% in a multilayered stand; snags.
2. Peregrine falcon	Recovery species (endangered)	Diverse range of vegetation types and seral stages: riparian areas: cliffs.
3. Goshawk	Sensitive species	Late successional stage (mature) conifers with canopy closure of at least 40%; meadows, openings, or riparian areas; snags; dead and downed logs.
4. Spotted owl	Sensitive species	Late successional stage (mature) conifers with at least 40% layered stand; snags: dead and downed logs.
5. Mule deer	RPA Emphasis group	Interspersion of many seral stages (edges); riparian vegetation; meadows, early to mid-successional stage of most vegetation types.
6. Pileated woodpecker	RPA Emphasis group (special interest, cavity nesters)	Large (> 24 inches) mature conifers with at least 40% canopy closure.
7. Mallard	Special interest and harvest species	Wetlands, large and small ponds and lakes: emergent vegetation; open water; invertebrates, submerged aquatics, and grasses.
8. Black bear	Special interest and harvest species	Mature conifer forest interspersed with brush patches and meadows; abundant dead and downed logs.
9. Blue grouse	Harvest species	Medium to large (mature) sized conifers with less than 40% canopy closure interspersed with brush patches and wet meadows.
10. Willow flycatcher	Sensitive species	Dense shrubby, riparian deciduous vegetation in large meadow areas.

Table III 10 Status of Wildlife Management Indicator Species

Species	Population Information	Trend	Current Habitat: Capability (acres) High	Medium	Low	Remarks
Bald Eagle	No current nesting, Last Nest in 1971, 4-10 in winter	Stable		460 (winter) 450 (nesting)		Winter area from Emerald Bay to Pope, Upper Truckee Marsh Numbers depend upon Kokanee salmon spawning runs and freezing of lakes and reservoir6
Peregrine Falcon	Historically nested in the basin before 1940	NA	3 cliff areas; designated in Peregrine Falcon Mgmt Plan (1982)			Reintroducton program 1985-87
Goshawk	Nine territories currently identified in the basin	Decreasing	6110	46633	52869	Potential in the Basin for 12-16 nesting pair.
Spotted Owl	No nesting pairs known to date, 3 individuals observed and/or heard over last several years	Probably Increasing	679	7503	48739	Habitat potential marginal basin is at eastern edge of range, elevation is extreme Habitat should improve as mid-aged timber matures
Mule Deer	Low numbers, Approximately 1300 in basin, summer range only	Stable to slight decline	42985 Forage 7623	Cover 70370 Forage 53078	3880 55286	Part of Loyalton/Truckee and Carson River deer herds Primarily summer range Trend affected by human disturbance in fawning and foraging areas
Pileated Woodpecker	Regularly observed in preferred habitats, no estimate of population	Probably stable	8180	5700	63410	Populations should increase in the future future as mid-age timber stands mature
Mallard	Readily observed, but numbers lower than past due to lost wetland in basin	Stable or increasing	0	2865	1360	Nesting improvements at Pope Marsh improved habitat Most impact from private land development and domestic dogs
Black Bear	Low	Increasing	18090	52470	19420	Urbanization limits present numbers Habitat capability should improve as forest matures
Blue Grouse	Uncommon nesting species in high elevation conifer stands	Stable	13190	63125	27315	Habitat capability should improve as forest matures
Willow Fly-catcher	Unknown, prefers large meadow areas	Stable or slight decline	0	1360	0	Riparian restoration and improvements should benefit species in the future

Bald eagle: The LTBMU contains wintering habitat for bald eagles. These areas consist of mid to late successional stages of mountainous riparian and mixed conifer forests. A 380-acre wintering area along the shore of Lake Tahoe is currently managed to minimize disturbance to the birds while they are in the area. Winter populations are estimated at four to ten birds.

The Pacific Northwest Bald Eagle Recovery Plan identifies four nesting territories as the goal for the Lake Tahoe area. The last bald eagles known to nest in the basin were in the early 1970's; no recent nesting attempts have been recorded. The limiting factor to future nesting is intensive human disturbance, especially boating and development in the feeding areas. The LTBMU has little control over these factors as most of this activity is not on national forest land. The LTBMU has the opportunity to maintain identified potential high quality nesting habitat for the bald eagle on national forest land.

Peregrine falcon: There is potential Peregrine nesting habitat (large rock cliffs) in the basin, but currently no nesting pairs. Falcons are occasionally observed during seasonal migrations. The last known nesting activity was by two pairs in the 1940's, one of which was on national forest land. Modification of habitat and eggshell thinning (as a result of DDT residues) are probable causes for the disappearance of local nesting populations.

A three year reintroduction program has been completed in conjunction with the Peregrine Falcon Recovery Team. It is too early to tell if any of the birds successfully hacked will mate and return to the area to nest. Prognosis for future reintroductions is guarded because location of the sites must be relatively free of golden eagles, a significant cause of mortality to the released birds in the hacking program.

Goshawk: Goshawk habitat is mature mixed conifer forest near riparian areas with some openings. Nine nesting territories have been identified on the LTBMU. Current available habitat capability indicates potential habitat for 12 to 16 nesting pairs on national forest land in the basin. Wildlife thresholds identify 12 nesting territories as a minimum for goshawk.

Current management includes protecting nest sites from disturbance during the nesting season and maintaining the vegetational integrity of all known nest site locations. Stringent water quality limitations on vegetation management, emphasis on riparian area protection and restoration, and natural maturation of most basin forest stands in the next 30 to 50 years should maintain and/or improve goshawk habitat capability.

Spotted owl: There are no spotted owl nesting territories in the basin at present and there is no historical evidence of them ever nesting here. The basin is at the eastern edge of their range and the mountain peaks may hinder their eastward movement into the basin. Owl habitat in the basin is marginal. Clearcutting in the late 1800's probably contributed to the limited density of owls.

Habitat capability for the species should improve as the forested land grows to maturity. As there are no records indicating that owls ever existed in any

appreciable numbers in the basin prior to widespread logging, however factors other than habitat may have always restricted numbers here.

National, State, and Forest Service emphasis on spotted owl management is expected to continue. Current direction is to determine the presence of owls and maintain the integrity of potential owl habitat in the timber sale planning process.

Mule deer: Deer habitat on the LTBMU consists of summer range only, mostly in the form of meadows and early to mid-successional vegetation stages with brush that can be used for forage and cover.

Deer numbers for the two herds on the basin, the Carson River and Loyalton-Truckee, are at 26 to 40% of historical levels. The estimate of Lake Tahoe Basin numbers (based on available habitat and estimates of deer per square mile) is 1,300 deer.

Demand for LTBMU deer is estimated to increase by 14 to 20%. Most of this demand is for hunting when the deer are wintering outside the basin. Demand for deer hunting is estimated at 2,500 WFUD (see EIS Appendix B for explanation of WFUD).

Management plans for the two herds have been prepared by the California Department of Fish and Game in conjunction with the Nevada Department of Wildlife, Forest Service, and the Bureau of Land Management. These plans call for a 40 to 100% increase in overall deer herd numbers by 1990. The RPA target for improvement of mule deer habitat capability is a 20% increase by 1990.

Several major factors which have caused deer population declines are identified in these plans. They include recreational and residential development resulting in habitat alteration and lack of fire and logging which has resulted in less early successional habitat being available. Increasing recreational use of fawning and foraging areas has also contributed significantly to population declines. It is important to prevent further disturbance of key deer use areas.

There are opportunities to increase deer habitat capability by approximately 10% over 1980 base year levels by 1990 through a more intensive vegetation management program. Deer numbers could increase by 40% over current levels following 30 to 50 years of intensive deer management. Increasing the amount of early to mid-successional vegetation would partially meet the opportunity to increase habitat capability by 10 to 40%. This would be accomplished by prescribed burning, brush manipulation, meadow restoration and enhancement, and coordination with timber and watershed activities to improve habitat in project areas. Stringent air and water quality standards may make it difficult and expensive to accomplish these goals.

Pileated woodpecker: Habitat for pileated woodpeckers is mature conifer forests with high numbers of large snags. Little is known of the populations in the basin. However, sightings of the birds in their preferred habitat is not unusual. Current management is aimed at maintaining preferred habitats. Habitat capability for this species should increase as large acreages of forested stands mature.

Mallard: Habitat for this species is marsh, wet meadow and creek drainages. Waterfowl habitat is only 30 to 40% of historical acreages in the basin. The primary nesting area used by waterfowl was marshlands along the southern shore of Lake Tahoe, almost half of which has been replaced by urban development. Recent habitat improvements for waterfowl, along with protection of wetlands from habitat alterations, have helped to stabilize (to slightly increase) the number of nesting mallards. Free-roaming dogs are an increasing mortality factor on the number of nesting mallards and other waterfowl.

There are opportunities to improve mallard habitat capability, mainly through direct habitat improvements such as nesting islands and maintaining or increasing water levels in existing or potential wetlands. Coordination with watershed restoration projects should identify potential habitat improvement projects that will benefit mallards and other waterfowl. The only controls the Forest Service can exert on free-roaming dogs are through signing and law enforcement on national forest lands.

Pope Marsh, one of the few remaining wetlands in the basin, is attractive to a local population of Canada geese. The presence of the geese in the adjacent Tahoe Keys subdivision (historically part of the marsh) has caused consternation among some of the residents who would like to have the geese removed. Seeking a compromise, the LTBMU has agreed not to increase the number of nesting structures placed in Pope Marsh. The nesting structures were placed to give waterfowl an elevated, predator-protected place to nest.

Demand for waterfowl hunting in the basin is low because firearm regulations around Lake Tahoe limit shooting. However, some of the waterfowl produced in the basin are hunted elsewhere, and overall demand is high. Estimates of nonconsumptive uses of wildlife, such as viewing, are 2,500 WFUD. Viewing waterfowl is an appreciable part of that overall use. Nonconsumptive uses of wildlife are expected to increase as dispersed recreation increases.

Black bear: Bear habitat is composed of conifer forest adjacent to meadows, riparian areas and mountain shrub communities. Forested habitats with large amounts of dead and down woody material are preferred.

Population estimates, based on habitat capability information, range from 35 to 40 animals. Urbanization of meadows and riparian areas has reduced historic bear habitat, and the number of bears is probably substantially less than what it once was.

There is little demand for bear hunting in the basin; however, seeing bears is a highly valued experience for recreationists. Occasionally, bears that enter urban areas and cause considerable disturbance may be trapped and relocated by the California Department of Fish and Game. However, there are fewer areas that bears can be released into since so much of the historic habitat is now occupied by humans that this is only done when absolutely necessary. Bears that are getting into garbage cans are not considered candidates for removal unless disturbance of a more serious nature develops.

Bear habitat capability is expected to improve as forested areas reach maturity and with the reduced role of natural fires. Maintenance of dead and down woody vegetation will also help to maintain bear habitat. Bear numbers are not

expected to increase appreciably as urbanization and recreation use of habitats in areas adjacent to them are still increasing.

Blue **grouse:** Grouse habitat consists of high elevation conifer forests and meadows. There are no estimates of the number of grouse in the basin, and sightings are uncommon. There is some demand for grouse hunting especially in Nevada which has one of the few huntable populations of grouse in that State.

Grouse benefit from undisturbed. high quality meadow habitats. Habitat capability should improve as high elevation stands mature in the absence of intensive logging and natural fire.

Willow **flycatcher:** The willow flycatcher has rarely been found to nest on the LTBMU. Preferred habitat includes dense willow areas in large wet meadows and low to mid-elevation riparian deciduous habitat. Destruction of these habitat types and nest parasitism by other birds is believed to have lead to a decline in numbers of this species. As riparian areas continue to be protected and improved numbers of this species appear to be stabilizing or slightly increasing. Population estimates are needed for the bird in preferred habitats.

(End Chapter 111)